

Amendments to the Specification:

Please replace the paragraph beginning on page 1, line 24, with the following rewritten paragraph:

DISCLOSURE OF THE INVENTION

Please add the following new paragraph after the paragraph ending on line 8 of page 2:

SUMMARY OF THE INVENTION

Please delete the paragraphs beginning on page 3, line 4, and ending on page 7, line 20:

~~According to the above fuse module, a power input from the power supply into the input terminal of the branch connection conductor is distributed to the respective power input sections of the circuit assembly through the corresponding fuse elements and the corresponding fuse connection terminals of the power input conductors. If an overcurrent occurs in any circuit, a corresponding one of the fuse elements will be fused to protect the circuit. Better still, the fuse elements are installed into the fuse installation portions formed in the common insulation housing, which enable concentrated management and easy replacement of the fuse elements.~~

~~That is, the present invention has an effect of distributing a power from a common power supply to the two or more power input sections while protecting the circuits with the fuse elements and enabling replacement and concentrated management of the fuse elements.~~

~~In the case where the circuit assembly has a plurality of bus bars including a plurality of input bus bars corresponding to the power input sections and the bus bars are arranged to~~

~~form a power circuit, each of the input bus bars may have an end which is formed with the fuse connection terminal and held in the insulation housing to serve as the power input conductor. These input bus bars can be additionally used as the power input conductors to reduce the number of components and enhance reliability in connection.~~

— ~~On the other hand, each of the power input conductors may have an electric connection portion protruding outside the insulation housing to be electrically connected to a corresponding one of the power input sections of the circuit assembly, which makes it possible to construct the fuse module independently of the circuit assembly.~~

— ~~In this fuse module, each of the power input conductors may be provided with a press-fit portion as the electric connection portion, the press-fit portion adapted to be press-fitted into a through-hole formed in a corresponding one of the power input sections to be electrically connected to the power input section, which enables an interconnection between the power input conductor and the power input section in a simplified structure without the need for soldering or the like.~~

— ~~The conductors and the fuse installation portions may be formed in any suitable shape and arranged in any suitable pattern. Preferably, the plurality of fuse installation portions formed in the insulation housing are arranged along a direction orthogonal to an aligning direction of the fuse connection terminals of the pair in each of the fuse installation portions, and the branch connection conductor extends along a direction in which the pairs of the fuse connection terminals are arranged. In this case, both the fuse installation portions and the branch connection portions can be disposed along a specific direction to reduce the entire height dimension (that is a size in a direction orthogonal to the specific direction) of the module.~~

— ~~In the present invention, the fuse module may include any suitable conductor other than the branch connection conductor and the power input conductor.~~

For example, the fuse module may include a power connection conductor having an input terminal adapted to be connected to an additional power supply other than the power supply to be connected to the input terminal of the branch connection conductor, and a fuse connection terminal. In this fuse module, the insulation housing holds the power connection conductor and a specific one of the power input conductors associated with the power connection conductor and adapted to be electrically connected to a specific one of the power input sections. The specific power input conductor has an end formed with a fuse connection terminal. The insulation housing is formed with a fuse installation portion for allowing one of the fuse elements to be detachably installed therein in such a manner that the fuse element is connected to the fuse connection terminal of the power connection conductor and the fuse connection terminal of the specific power input conductor, and interposed between the two fuse connection terminals. This makes it possible to input a power to the circuit assembly through a different line from the branch connection conductor.

In this case, the branch connection conductor and the power connection conductor may be disposed such that each of the fuse connection terminals formed in the branch connection conductor and the fuse connection terminal formed in the power connection conductor are aligned approximately in a line. This enables a power input through a plurality of lines with a small height dimension of the entire module.

The fuse module of the present invention may include an output conductor which is adapted to be connected to a power output section provided in the circuit assembly and has a fuse connection terminal at an end, and an external output conductor which has an external output terminal and a fuse connection terminal. In this fuse module, the insulation housing holds the output conductor and the external output conductor, formed with a fuse installation portion in which one of the fuse elements is detachably installed in such a manner that the fuse element is connected to the fuse connection terminal of the output conductor and the

~~the fuse connection terminal of the corresponding external output conductor, to be interposed between the two fuse connection terminals. This makes it possible to interpose the fuse element between the input terminal of the branch connection conductor and each of the power input sections of the circuit assembly, and further to output a power from the power output section of the circuit assembly to an external circuit through the fuse element and the external output conductor. Better still, the fuse elements are installed into the respective fuse installation portions formed in the common insulation housing, which enable concentrated management of the fuse elements interposed between the power output section and the external output conductor with the fuse elements interposed between the branch connection conductor and the respective power input sections.~~

— ~~In this fuse module, when the circuit assembly has a plurality of bus bars including an output bus bar corresponding to the power output section, and the bus bars are arranged to form a power circuit, the output bus bar may have an end which is formed with the fuse connection terminal and directly held within the insulation housing to serve as the power output conductor. In this case, the output bus bars can be additionally used as the power output conductors to reduce the number of components and enhance reliability in connection. Otherwise, the power output conductor may have an electric connection portion which is formed to protrude outside the insulation housing, and electrically connected to the power output section of the circuit assembly, which makes it possible to construct the fuse module independently of the circuit assembly.~~

— ~~The branch connection conductor may include not only the fuse connection terminals, but also a direct connection portion adapted to be electrically connected directly to a specific one of the power input sections in the circuit assembly without interposition of the fuse element. This enables both a power input through the fuse elements and a direct power input~~

~~without interposition of the fuse element into the circuit assembly, with the common branch connection conductor.~~

— ~~In a specific embodiment, the branch connection conductor may include an inter-terminal portion extending in a direction parallel to an arranging direction of the fuse installation portions in the insulation housing so as to pass through between the fuse connection terminals of the pair disposed at a specific one of the fuse installation portions of the insulation housing, the direct connection portion extending from the inter-terminal portion toward the specific power input section. This allows the branch connection bus bar to extend in a direction parallel to the arranging direction of the fuse installation portions in the insulation housing with effective utilization of a space between the fuse connection terminals of the pair, and enables a direct power input from the inter-terminal portion disposed between the fuse connection terminals of the pair to the circuit assembly through the direct connection portion without interposition of the fuse element. Thus, even if the power input sections of the circuit assembly are located at spaced apart positions between which the output conductor and the external output conductor exist, a power can be input from the branch connection conductor to each of the power input sections.~~

— ~~The present invention provides also a fuse module equipped circuit assembly comprising the above fuse module, and a circuit assembly having a plurality of power input sections, each of the power input conductors of the fuse module electrically connected to a corresponding one of the power input sections.~~

— ~~This circuit assembly enables a power distribution from a common power supply to a plurality of the power input sections through the fuse elements, in a simple structure where the fuse module is simply attached to the circuit assembly.~~

— ~~In the fuse module equipped circuit assembly, the circuit assembly may include a current detection bus bar with an input terminal and an output terminal between which a~~

~~the detection target current is allowed to flow, at least one of the input terminal and output terminals held in the insulation housing. The incorporation of the current detection bus bar in the circuit assembly add a current detection function to the circuit assembly, while at least one of the input and output terminals of the current detection bus bar being held in a simple structure with utilization of the insulation housing.~~

~~Further, the insulation housing may hold the output terminal of the current detection bus bar and the input terminal of the branch connection conductor in a state that the output terminal and the input terminal are superimposed on each other. This structure enables electrical interconnection between the output terminal of the current detection bus bar and the input terminal of the branch connection conductor, which allows a power distribution circuit comprising the fuse module and the circuit assembly to be connected to a downstream side of the current detection bus bar.~~

~~The present invention further provides a structure for mounting the above fuse module to a vehicle, wherein the input terminal of the branch connection conductor is fixed to a vehicle mounted device or a vehicle body, while superimposed on a circuit connection bus bar for connecting a power supply connected to the input terminal to another vehicle mounted circuit.~~

~~The mounting structure realizes both an connection of the input terminal of the branch connection conductor and an external circuit to the power supply, and a fixation of the fuse module simultaneously only with fastening the input terminal of the branch connection conductor to a vehicle mounted device or a vehicle body in a state that the input terminal is superimposed onto the external circuit connection bus bar.~~

Please replace the paragraph beginning on page 8, line 25, with the following rewritten paragraph:

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS OF BEST
MODE FOR CARRYING OUT THE INVENTION

Please replace the paragraph beginning on page 17, line 13, with the following rewritten paragraph:

The current which has flowed into the output terminal 12 is supplied to an external circuit through the external-circuit-connection bus bars 64, 66 connected to the output terminal 12, while flowing into the input terminal 55 of the branch-connection bus bar 54 superimposed on the output terminal 12 and being distributed from the respective fuse-connection terminals 54a of the branch-connection bus bar 54 to the respective fuse-connection terminals 22a of the input bus bars 22 through the corresponding fuse elements 16. The current which has flowed into the input bus bars 22 further flows into the respective output bus bars 24, 25 through the corresponding switching elements 18, and is output from the tab terminals 24a of the output bus bars 24 to an external circuit through a connector fitted in the tab terminals 24a. The current is further output from the circuit assembly to an external circuit also through the fuse-connection terminals 25a of the output bus bar 25, the fuse elements 16, the external-output conductors 56, and a connector fitted into the external-output conductors 56.

Please replace the paragraph beginning on page 17, line 25, with the following rewritten paragraph:

On the other hand, from the battery which is an additional power supply other than the alternator, a power is input also into the input bus bar 23 through the power-input terminal 53a and the fuse element 16, and introduced into the power circuit.

Please replace the paragraph beginning on page 20, line 16, with the following rewritten paragraph:

In FIGS. 12 to 14, the branch-connection bus bar 54 has three direct-connection portions 54b in addition to the fuse-connection terminals 54a, and further between the direct-connection portions 54b are interposed a plurality of conductor pairs. As also shown in FIG. 13B, each of the conductor pairs consist of a fuse-input conductor 23' for introducing a power from the bus bar layer BL and inputting the power into one of the terminals 16a of the fuse element 16 installed in the fuse-installation portion 52a, and a fuse-output conductor 24' for outputting the power from the other terminal 16a of the fuse element 16 to the output bus bar 24 of the bus bar layer BL. The conductors 23', 24' are formed with fuse-connection terminals 23a, 24i respectively, which are located in respective fuse-installation portions 1652a.

Please replace the paragraph beginning on page 20, line 25, with the following rewritten paragraph:

On the other hand, the branch-connection bus bar 54 is, as shown in FIG. 14B, formed with an inter-terminal portion 54c extending in a direction parallel to the arranging direction of the fuse-installation portions 1652a so as to pass through between the fuse-connection terminals 23a, 24i. From the inter-terminal portion 54c through the lateral side of the conductor pair 23', 24', the direct connection portions 54b protrudes downward from the lower surface of the insulation housing 52, the protruded end of the direct connection portion 54b bent toward the bus bar layer BL to be connected to the input bus bar 22.

Please replace the paragraph beginning on page 21, line 3, with the following rewritten paragraph:

This structure allows the branch-connection bus bar 54 to extend in a direction parallel to the arranging direction of the fuse-installation portions ~~1652a~~ by effective utilization of a space between the fuse-connection terminal pair 23a, 24i, thus allowing the direct-connection portions 54b to be formed at a desirable position in the bus bar 5.

Please add the following new paragraphs after the paragraph ending on line 13 of page 21:

As described above, there is a fuse module for supplying a power from a common power supply to a plurality of power input sections of a circuit assembly through respective fuse elements. The fuse module comprises: a branch-connection conductor having an input terminal adapted to be connected to the power supply and a plurality of fuse-connection terminals disposed correspondingly to the respective power input sections; a plurality of power-input conductors electrically connected to a corresponding one of the power input sections and each having a fuse-connection terminal disposed in a pair with a corresponding one of the fuse-connection terminals of the branch-connection conductor; and an insulation housing holding the branch-connection conductor and the power-input conductors. The insulation housing is formed with a plurality of fuse-installation portions for allowing the respective fuse elements to be detachably installed therein in such a manner that each of the fuse elements is connected to the fuse-connection terminal of the branch-connection conductor and the corresponding fuse-connection terminal of the power-input conductor, to be interposed between the fuse-connection terminals of the each pair.

According to the above fuse module, a power input from the power supply into the input terminal of the branch-connection conductor is distributed to the respective power input sections of the circuit assembly through the corresponding fuse elements and the corresponding fuse-connection terminals of the power-input conductors. If an overcurrent occurs in any circuit, a corresponding one of the fuse elements will be fused to protect the circuit. Better still, the fuse elements are installed into the fuse-installation portions formed in the common insulation housing, which enable concentrated management and easy replacement of the fuse elements.

That is, the present invention has an effect of distributing a power from a common power supply to the two or more power input sections while protecting the circuits with the fuse elements and enabling replacement and concentrated management of the fuse elements.

In the case where the circuit assembly has a plurality of bus bars including a plurality of input bus bars corresponding to the power input sections and the bus bars are arranged to form a power circuit, each of the input bus bars may have an end which is formed with the fuse-connection terminal and held in the insulation housing to serve as the power-input conductor. These input bus bars can be additionally used as the power-input conductors to reduce the number of components and enhance reliability in connection.

On the other hand, each of the power-input conductors may have an electric-connection portion protruding outside the insulation housing to be electrically connected to a corresponding one of the power input sections of the circuit assembly, which makes it possible to construct the fuse module independently of the circuit assembly.

In this fuse module, each of the power-input conductors may be provided with a press-fit portion as the electric-connection portion, the press-fit portion adapted to be press-fitted into a through-hole formed in a corresponding one of the power input sections to be electrically connected to the power input section, which enables an interconnection between

the power-input conductor and the power input section in a simplified structure without the need for soldering or the like.

The conductors and the fuse-installation portions may be formed in any suitable shape and arranged in any suitable pattern. Preferably, the plurality of fuse-installation portions formed in the insulation housing are arranged along a direction orthogonal to an aligning direction of the fuse-connection terminals of the pair in each of the fuse-installation portions, and the branch-connection conductor extends along an direction in which the pairs of the fuse-connection terminals are arranged. In this case, both the fuse-installation portions and the branch-connection portions can be disposed along a specific direction to reduce the entire height dimension (that is a size in a direction orthogonal to the specific direction) of the module.

In the present invention, the fuse module may include any suitable conductor other than the branch-connection conductor and the power-input conductor.

For example, the fuse module may include a power-connection conductor having an input terminal adapted to be connected to an additional power supply other than the power supply to be connected to the input terminal of the branch-connection conductor, and a fuse-connection terminal. In this fuse module, the insulation housing holds the power-connection conductor and a specific one of the power-input conductors associated with the power-connection conductor and adapted to be electrically connected to a specific one of the power input sections. The specific power-input conductor has an end formed with a fuse-connection terminal. The insulation housing is formed with a fuse-installation portion for allowing one of the fuse elements to be detachably installed therein in such a manner that the fuse element is connected to the fuse-connection terminal of the power-connection conductor and the fuse-connection terminal of the specific power-input conductor, and interposed between the two

fuse-connection terminals. This makes it possible to input a power to the circuit assembly through a different line from the branch-connection conductor.

In this case, the branch-connection conductor and the power-connection conductor may be disposed such that each of the fuse-connection terminals formed in the branch-connection conductor and the fuse-connection terminal formed in the power-connection conductor are aligned approximately in a line. This enables a power input through a plurality of lines with a small height dimension of the entire module.

The fuse module of the present invention may include an output conductor which is adapted to be connected to a power output section provided in the circuit assembly and has a fuse-connection terminal at an end, and an external-output conductor which has an external-output terminal and a fuse-connection terminal. In this fuse module, the insulation housing holds the output conductor and the external-output conductor, formed with a fuse-installation portion in which one of the fuse elements is detachably installed in such a manner that the fuse element is connected to the fuse-connection terminal of the output conductor and the fuse-connection terminal of the corresponding external-output conductor, to be interposed between the two fuse-connection terminals. This makes it possible to interpose the fuse element between the input terminal of the branch-connection conductor and each of the power input sections of the circuit assembly, and further to output a power from the power output section of the circuit assembly to an external circuit through the fuse element and the external-output conductor. Better still, the fuse elements are installed into the respective fuse-installation portions formed in the common insulation housing, which enable concentrated management of the fuse elements interposed between the power output section and the external-output conductor with the fuse elements interposed between the branch-connection conductor and the respective power input sections.

In this fuse module, when the circuit assembly has a plurality of bus bars including an output bus bar corresponding to the power output section, and the bus bars are arranged to form a power circuit, the output bus bar may have an end which is formed with the fuse-connection terminal and directly held within the insulation housing to serve as the power-output conductor. In this case, the output bus bars can be additionally used as the power-output conductors to reduce the number of components and enhance reliability in connection. Otherwise, the power-output conductor may have an electric-connection portion which is formed to protrude outside the insulation housing, and electrically connected to the power output section of the circuit assembly, which makes it possible to construct the fuse module independently of the circuit assembly.

The branch-connection conductor may include not only the fuse-connection terminals, but also a direct-connection portion adapted to be electrically connected directly to a specific one of the power input sections in the circuit assembly without interposition of the fuse element. This enables both a power input through the fuse elements and a direct power input without interposition of the fuse element into the circuit assembly, with the common branch-connection conductor.

In a specific embodiment, the branch-connection conductor may include an inter-terminal portion extending in a direction parallel to an arranging direction of the fuse-installation portions in the insulation housing so as to pass through between the fuse-connection terminals of the pair disposed at a specific one of the fuse-installation portions of the insulation housing, the direct-connection portion extending from the inter-terminal portion toward the specific power input section. This allows the branch-connection bus bar to extend in a direction parallel to the arranging direction of the fuse-installation portions in the insulation housing with effective utilization of a space between the fuse-connection terminals of the pair, and enables a direct power input from the inter-terminal portion disposed between

the fuse-connection terminals of the pair to the circuit assembly through the direct-connection portion without interposition of the fuse element. Thus, even if the power input sections of the circuit assembly are located at spaced-apart positions between which the output conductor and the external-output conductor exist, a power can be input from the branch-connection conductor to each of the power input sections.

The present invention provides also a fuse module-equipped circuit assembly comprising the above fuse module, and a circuit assembly having a plurality of power input sections, each of the power-input conductors of the fuse module electrically connected to a corresponding one of the power input sections.

This circuit assembly enables a power distribution from a common power supply to a plurality of the power input sections through the fuse elements, in a simple structure where the fuse module is simply attached to the circuit assembly.

In the fuse module-equipped circuit assembly, the circuit assembly may include a current-detection bus bar with an input terminal and an output terminal between which a detection-target current is allowed to flow, at least one of the input terminal and output terminals held in the insulation housing. The incorporation of the current-detection bus bar in the circuit assembly add a current-detection function to the circuit assembly, while at least one of the input and output terminals of the current-detection bus bar being held in a simple structure with utilization of the insulation housing.

Further, the insulation housing may hold the output terminal of the current-detection bus bar and the input terminal of the branch-connection conductor in a state that the output terminal and the input terminal are superimposed on each other. This structure enables electrical interconnection between the output terminal of the current-detection bus bar and the input terminal of the branch-connection conductor, which allows a power distribution circuit

comprising the fuse module and the circuit assembly to be connected to a downstream side of the current-detection bus bar.

The present invention further provides a structure for mounting the above fuse module to a vehicle, wherein the input terminal of the branch-connection conductor is fixed to a vehicle-mounted device or a vehicle body, while superimposed on a circuit-connection bus bar for connecting a power supply connected to the input terminal to another vehicle-mounted circuit.

The mounting structure realizes both a connection of the input terminal of the branch-connection conductor and an external circuit to the power supply, and a fixation of the fuse module simultaneously only with fastening the input terminal of the branch-connection conductor to a vehicle-mounted device or a vehicle body in a state that the input terminal is superimposed onto the external-circuit-connection bus bar.